

REMARKS

Claims 1-42 are currently pending in the application. Claims 11-21 and 30-42 have been canceled, and Claims 8 and 29 were previously withdrawn. Claims 1, 7, 22, and 28 have been amended. Claims 43-50 have been added. Applicant respectfully requests reconsideration of the pending claims in view of the following remarks.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 102 as anticipated by Hou.

Hou does not disclose the subject matter of amended independent Claim 1. More specifically, Hou does not disclose, among other things, a chromatography cartridge including the following elements:

- a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;
- b) a first frit positioned in the interior volume, the first frit having a first surface oriented substantially parallel to a lateral surface of the first portion of the first plug, the first surface of the first frit being in contact with the lateral surface of the first portion of the first plug;
- c) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing; and
- d) a second frit positioned in the interior volume, the second frit having a first surface oriented substantially parallel to a lateral surface of the first portion of the second plug, the first

surface of the second frit being in contact with the lateral surface of the first portion of the second plug.

Rather, Hou discloses a cartridge 10 including a cylindrical tube 13 and a cylinder end cap 36. The end cap 36 is connected to the top edge 31 of the cylinder 13. The cartridge 10 does not disclose the structure specified in at least the elements noted above.

For at least these reasons, Hou does not disclose the subject matter of Claim 1. Accordingly, independent Claim 1 is allowable. Claims 2-10 depend from Claim 1, and are therefore allowable for at least the reasons Claim 1 is allowable.

Hou does not disclose the subject matter of amended independent Claim 22. More specifically, Hou does not disclose, among other things, a chromatography cartridge including the following elements:

- a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and
- b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Hou discloses a cartridge 10 including a cylindrical tube 13 and a cylinder end cap 36. The end cap 36 is connected to the top edge 31 of the cylinder 13. The cartridge 10 does not disclose the structure specified in at least the elements noted above.

For at least these reasons, Hou does not disclose the subject matter of Claim 22. Accordingly, independent Claim 22 is allowable. Claims 23-29 depend from Claim 22, and are therefore allowable for at least the reasons Claim 22 is allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 4,626,350 ("Reid").

Reid does not disclose the subject matter of amended independent Claim 1. More specifically, Reid does not disclose, among other things, a chromatography cartridge including the following elements:

a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;

b) a first opening extending through the first plug, the first opening being in fluid communication with the interior volume, the first plug including a protruding extension through which the first opening extends; and

c) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing.

Rather, Reid discloses a filter cartridge 10 including a tubular wall element 14 and closures 16, 18 at opposite ends. The closures 16, 18 include permeable components for allowing fluid to enter and exit the cartridge 10. The filter cartridge 10 does not disclose the structure specified in at least the elements noted above.

For at least these reasons, Reid does not disclose the subject matter of Claim 1. Accordingly, independent Claim 1 is allowable. Claims 2-10 depend from Claim 1, and are therefore allowable for at least the reasons Claim 1 is allowable.

Reid does not disclose the subject matter of amended independent Claim 22. More specifically, Reid does not disclose, among other things, a chromatography cartridge including the following elements:

a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and

b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Reid discloses a filter cartridge 10 including a tubular wall element 14 and closures 16, 18 at opposite ends. The closures 16, 18 include permeable components for allowing fluid to enter and exit the cartridge 10. The filter cartridge 10 does not disclose the structure specified in at least the elements noted above.

For at least these reasons, Reid does not disclose the subject matter of Claim 22. Accordingly, independent Claim 22 is allowable. Claims 23-29 depend from Claim 22, and are therefore allowable for at least the reasons Claim 22 is allowable.

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,693,223 ("Yamada") in view of U.S. Patent No. 6,280,619 ("Lacy") and U.S. Patent No. 6,953,526 ("Fritze").

Yamada does not disclose the subject matter of amended independent Claim 1. More specifically, Yamada does not disclose a chromatography cartridge including the following elements:

a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;

b) a first opening extending through the first plug, the first opening being in fluid communication with the interior volume, the first plug including a protruding extension through which the first opening extends; and

c) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing.

Rather, Yamada discloses a column device including a column body 1 having an open end 3 and a funnel-shaped end 4. The column device also includes a cylindrical head portion 2 inserted in the open end 3 of the column body 1. The column device does not disclose the structure specified in at least the elements noted above.

Lacy does not cure the deficiencies of Yamada. Lacy does not disclose a chromatography cartridge including the following elements:

a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;

b) a first opening extending through the first plug, the first opening being in fluid communication with the interior volume, the first plug including a protruding extension through which the first opening extends; and

c) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing.

Rather, Lacy discloses an inline water filter including a hollow body 22 and an integrally-formed cap 24 at its lower end and a spin-welded cap 26 at its upper end. The integrally-formed cap 24 is formed with the hollow body 22 as a single piece. The inline water filter does not disclose the structure specified in at least the elements noted above.

Fritze does not cure the deficiencies of Yamada and Lacy. Fritze does not disclose a chromatography cartridge including the following elements:

a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;

b) a first opening extending through the first plug, the first opening being in fluid communication with the interior volume, the first plug including a protruding extension through which the first opening extends; and

c) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end,

the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing.

Rather, Fritze discloses a cartridge assembly 14 including a housing assembly 150 and an interiorly disposed filtration assembly 152. The housing assembly 150 has a generally cylindrical barrel 154 that is closed at a first end by a rounded end 156. The barrel 154 and the rounded end 156 may be formed as a single component or may be formed as two separate components bonded together. The barrel 154 includes an upper margin 160, opposite the rounded end 156, and defines an opening to the interior of the housing assembly 150. An end cap 166 is disposable within the opening defined by the inside margin 162 of the upper margin 160. The cartridge assembly 14 does not disclose the structure specified in at least the elements noted above.

In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Yamada, Lacy, and Fritze do not teach or suggest the subject matter of independent Claim 1. Accordingly, Claim 1 is allowable. Claims 2-10 depend from Claim 1, and are allowable for at least the reasons Claim 1 is allowable.

Yamada does not disclose the subject matter of amended independent Claim 22. More specifically, Yamada does not disclose a chromatography cartridge including the following elements:

- a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and
- b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a

length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Yamada discloses a column device including a column body 1 having an open end 3 and a funnel-shaped end 4. The column device also includes a cylindrical head portion 2 inserted in the open end 3 of the column body 1. The column device does not disclose the structure specified in at least the elements noted above.

Lacy does not cure the deficiencies of Yamada. Lacy does not disclose a chromatography cartridge including the following elements:

- a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and
- b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Lacy discloses an inline water filter including a hollow body 22 and an integrally-formed cap 24 at its lower end and a spin-welded cap 26 at its upper end. The integrally-formed cap 24 is formed with the hollow body 22 as a single piece. The inline water filter does not disclose the structure specified in at least the elements noted above.

Fritze does not cure the deficiencies of Yamada and Lacy. Fritze does not disclose a chromatography cartridge including the following elements:

- a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface,

at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and

b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Fritze discloses a cartridge assembly 14 including a housing assembly 150 and an interiorly disposed filtration assembly 152. The housing assembly 150 has a generally cylindrical barrel 154 that is closed at a first end by a rounded end 156. The barrel 154 and the rounded end 156 may be formed as a single component or may be formed as two separate components bonded together. The barrel 154 includes an upper margin 160, opposite the rounded end 156, and defines an opening to the interior of the housing assembly 150. An end cap 166 is disposable within the opening defined by the inside margin 162 of the upper margin 160. The cartridge assembly 14 does not disclose the structure specified in at least the elements noted above.

In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Yamada, Lacy, and Fritze do not teach or suggest the subject matter of independent Claim 22. Accordingly, Claim 22 is allowable. Claims 23-29 depend from Claim 22, and are allowable for at least the reasons Claim 22 is allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,360,544 ("Nakaso") in view of Lacy and Fritze.

Nakaso does not disclose the subject matter of amended independent Claim 1. More specifically, Nakaso does not disclose a chromatography cartridge including the following elements:

a) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer

circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and

b) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing.

Rather, Nakaso discloses a cartridge 1 having a cylindrical chamber 2, a sample inlet opening 3, and a sample outlet 4. The cartridge 1 does not disclose the structure specified in at least the elements noted above.

Lacy and Fritze do not cure the deficiencies of Nakaso for at least the reasons discussed above. In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Nakaso, Lacy, and Fritze do not teach or suggest the subject matter of independent Claim 1. Accordingly, Claim 1 is allowable. Claims 2-10 depend from Claim 1, and are allowable for at least the reasons Claim 1 is allowable.

Nakaso does not disclose the subject matter of amended independent Claim 22. More specifically, Nakaso does not disclose a chromatography cartridge including the following elements:

a) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and

b) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Nakaso discloses a cartridge 1 having a cylindrical chamber 2, a sample inlet opening 3, and a sample outlet 4. The cartridge 1 does not disclose the structure specified in at least the elements noted above.

Lacy and Fritze do not cure the deficiencies of Nakaso for at least the reasons discussed above. In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Nakaso, Lacy, and Fritze do not teach or suggest the subject matter of independent Claim 22. Accordingly, Claim 22 is allowable. Claims 23-29 depend from Claim 22, and are allowable for at least the reasons Claim 22 is allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Lacy and Fritze, and further in view of U.S. Patent No. 6,454,891 ("Goss").

Claim 7 depends from Claim 1, and is therefore allowable for at least the reasons Claim 1 is allowable. As discussed above, Yamada, Lacy, and Fritze do not disclose the subject matter of amended independent 1.

Goss does not cure the deficiencies of Yamada, Lacy, and Fritze. Goss does not disclose a chromatography cartridge including at least the following elements:

a) a tubular housing having a first open end, a second open end, an outer surface, and an inner surface, the tubular housing defining an interior volume;

b) a first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug positioned through the first open end and into the interior volume and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the first plug positioned outside the interior volume and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing;

c) a first frit positioned in the interior volume, the first frit having a first surface oriented substantially parallel to a lateral surface of the first portion of the first plug, the first surface of the first frit being in contact with the lateral surface of the first portion of the first plug;

d) a first opening extending through the first plug, the first opening being in fluid communication with the interior volume, the first plug including a protruding extension through which the first opening extends;

e) a second plug including an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug positioned through the second open end and into the interior volume, and having an outer circumferential surface, a substantial portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, and a second portion of the second plug positioned outside of the interior volume and extending toward the first open end, the second portion of the second plug extending along and overlapping a portion of the outer surface of the tubular housing;

f) a second opening extending through the second plug, the second opening being in fluid communication with the interior volume; and

g) a second frit positioned in the interior volume, the second frit having a first surface oriented substantially parallel to a lateral surface of the first portion of the second plug, the first surface of the second frit being in contact with the lateral surface of the first portion of the second plug.

Rather, Goss discloses a spin weld assembly 120 including an insert 122, a boss 124, and a fastener 126. The assembly 120 does not disclose the structure specified in at least the elements noted above.

In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Yamada, Lacy, Fritze, and Goss do not teach or suggest the subject matter of independent Claim 1. Accordingly, Claim 1 is allowable. Claims 2-10 depend from Claim 1, and are allowable for at least the reasons Claim 1 is allowable.

Claim 28 depends from Claim 22, and is therefore allowable for at least the reasons Claim 22 is allowable. As discussed above, Yamada, Lacy, and Fritze do not disclose the subject matter of amended independent 22.

Goss does not cure the deficiencies of Yamada, Lacy, and Fritze. Goss does not disclose a chromatography cartridge including at least the following elements:

- a) a tubular housing having an inlet, an outlet, a first open end and a second open end, a longitudinal axis and an inner surface;
- b) a first porous disk positioned within the tubular housing adjacent the inlet;
- c) a second porous disk positioned within the tubular housing adjacent the outlet;
- d) at least one chromatography medium received in the tubular housing and disposed axially between the first porous disk and the second porous disk;
- e) a first plug positioned within the first open end of the tubular housing, the first plug having a first lateral surface in contact with the first porous disk and a second surface outside of the tubular housing, the first plug including an annular groove adapted to receive the first open end of the tubular housing, a first portion of the first plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the first plug including the inlet, and a second portion of the first plug positioned outside of the tubular housing and extending toward the second open end, the second portion of the first plug extending along and overlapping a portion of the outer surface of the tubular housing; and
- f) a second plug positioned within the second open end of the tubular housing, the second plug having a first lateral surface in contact with the second porous disk and a second surface outside of the tubular housing, the second plug having an annular groove adapted to receive the second open end of the tubular housing, a first portion of the second plug having an outer circumferential surface, at least a portion of the outer circumferential surface having a length greater than the thickness of the tubular housing and being fused to the inner surface of the tubular housing, the second plug including the outlet.

Rather, Goss discloses a spin weld assembly 120 including an insert 122, a boss 124, and a fastener 126. The assembly 120 does not disclose the structure specified in at least the elements noted above.

In addition, there is no suggestion or motivation to combine the references. For at least these reasons, Yamada, Lacy, Fritze, and Goss do not teach or suggest the subject matter of independent Claim 22. Accordingly, Claim 22 is allowable. Claims 23-29 depend from Claim 22, and are allowable for at least the reasons Claim 22 is allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Nakaso in view of Lacy and Fritze, and further in view of Goss.

For at least the reasons discussed above, Nakaso, Lacy, Fritze, and Goss do not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Lacy and Fritze, and further in view of Hou.

Claim 9 depends from Claim 1, and is therefore allowable for at least the reasons Claim 1 is allowable. For at least the reasons discussed above, Yamada, Lacy, Fritze, and Hou do not disclose the subject matter of Claim 9. Accordingly, Claim 9 is allowable.

The Examiner rejected Claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Nakaso in view of Lacy and Fritze, and further in view of Hou.

Claim 9 depends from Claim 1, and is therefore allowable for at least the reasons Claim 1 is allowable. For at least the reasons discussed above, Nakaso, Lacy, Fritze, and Hou do not disclose the subject matter of Claim 9. Accordingly, Claim 9 is allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of U.S. Patent No. 4,626,350 ("Reid"), Lacy, and Fritze.

For at least the reasons discussed above, Reid, Lacy, and Fritze do not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Nakaso in view of Reid, Lacy, and Fritze.

For at least the reasons discussed above, Nakaso, Reid, Lacy, and Fritze do not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Reid, Lacy, and Fritze, and further in view of Goss.

For at least the reasons discussed above, Yamada, Reid, Lacy, Fritze, and Goss do not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Nakaso in view of Reid, Lacy, and Fritze, and further in view of Goss.

For at least the reasons discussed above, Nakaso, Reid, Lacy, Fritze, and Goss do not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Yamada in view of Reid, Lacy, and Fritze, and further in view of Hou.

For at least the reasons discussed above, Yamada, Reid, Lacy, Fritze, and Hou do not disclose the subject matter of Claim 9. Accordingly, Claim 9 is allowable.

The Examiner rejected Claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Nakaso in view of Reid, Lacy, and Fritze, and further in view of Hou.

For at least the reasons discussed above, Nakaso, Reid, Lacy, Fritze, and Hou do not disclose the subject matter of Claim 9. Accordingly, Claim 9 is allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Hou.

For at least the reasons discussed above, Hou does not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Hou in view of Lacy and Fritze.

For at least the reasons discussed above, Hou, Lacy, and Fritze do not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Hou.

For at least the reasons discussed above, Hou does not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Hou in view of Lacy and Fritze, and further in view of Goss.

For at least the reasons discussed above, Hou, Lacy, Fritze, and Goss do not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Hou in view of Reid.

For at least the reasons discussed above, Hou and Reid do not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Hou in view of Reid, Lacy, and Fritze.

For at least the reasons discussed above, Hou, Reid, Lacy, and Fritze do not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

The Examiner rejected Claims 7 and 28 under 35 U.S.C. § 103(a) as being unpatentable over Hou in view Reid, Lacy, and Fritze, and further in view of Goss.

For at least the reasons discussed above, Hou, Reid, Lacy, Fritze, and Goss do not disclose the subject matter of Claims 7 and 28. Accordingly, Claims 7 and 28 are allowable.

The Examiner rejected Claims 1-7, 9-10, and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Reid.

For at least the reasons discussed above, Reid does not disclose the subject matter of independent Claims 1 and 22. Accordingly, Claims 1 and 22 and the respective dependent claims are allowable.

CONCLUSION

In view of the foregoing, allowance of Claims 1-7, 9, 10 and 22-28 is respectfully requested. The undersigned is available for telephone consultation during normal business hours.

Respectfully submitted,

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